DIVISION 9 – FINISHES
Section 09600 – Floor Finishes

Part 1 - General

1.01 Summary

A. This specification describes the application of a waterproofing, slip resistant, wearing surface using a low modulus epoxy binder and selected aggregate.

1.02 Quality Assurance

A. Manufacturing qualifications: The manufacturer of the specified product shall be ISO 9001/9002 certified and have in existence a recognized ongoing quality assurance program independently audited on a regular basis.

B. Contractor qualifications: Contractor shall be qualified in the field of concrete repair and protection with a successful track record of 5 years or more. Contractor shall maintain qualified personnel who have received product training by a manufacturer's representative.

C. Install materials in accordance with all safety and weather conditions required by manufacturer or as modified by applicable rules and regulations of local, state and federal authorities having jurisdiction. Consult Material Safety Data Sheets for complete handling recommendations.

1.03 Delivery, Storage, and Handling

A. All materials must be delivered in original, unopened containers with the manufacturer's name, labels, product identification, and batch numbers. Damaged material must be removed from the site immediately.

B. Store all materials off the ground and protect from rain, freezing or excessive heat until ready for use.

C. Condition the specified product as recommended by the manufacturer.

1.04 Job Conditions

A. Environmental Conditions: Do not apply material if it is raining or snowing or if such conditions appear to be imminent. Minimum application temperature 40ºF (5ºC) and rising.

B. Protection: Precautions should be taken to avoid damage to any surface near the work zone due to mixing and handling of the specified coating.

1.05 Submittals

A. Submit two copies of manufacturer's literature, to include: Product Data Sheet, and appropriate Material Safety Data Sheets (MSDS).

1.06 Warranty

A. Provide a written warranty from the manufacturer against defects of materials for a period of one (1) year, beginning with date of substantial completion of the project.

Part 2 - Products

2.01 Manufacturers

A. Sikadur 22, Lo-Mod, as manufactured by Sika Corporation,1682 Marion Williamsport Road, Marion, Ohio 43302 is considered to conform to the requirements of this specification and has performed satisfactorily for overlaying for a minimum of ten years.

B. Any materials required for repair prior to installation of the broadcast wearing surface shall be manufactured by the same supplier of the proposed epoxy broadcast system

2.02 Materials

A. Epoxy resin adhesive binder shall be a two component, 100% solids.

1. Component A shall be a modified epoxy resin of the diglycidylether bisphenol A or containing suitable viscosity control agents. It shall not contain butyl glycidyl ether.
2. Component B shall be primarily a reaction product of a selected amine blend containing suitable viscosity control agents and accelerators.
3. The ratio of component A to component B shall be one to one (1:1) by volume.

B. Broadcast aggregate shall be a clean, oven dried quartz sand with a minimum gradation listed in the table below and a minimum hardness of 6 per the Moh's scale.

Mesh	16	20	30	40	50	70
%	0-5	35-50	40-55	3.0-8.0	>1	>7.5

2.03 Performance Criteria

A. Properties of the mixed epoxy resin adhesive binder:

1. Pot Life: 30 minutes (200 gram mass)
2. Tack-Free Time to Touch (4-7 mil)

40˚F	73˚F	90˚F
21 hrs.	4 hrs.	2 hrs.

3. Initial Viscosity (Brookfield Viscometer, Spindle #3; Speed 100): 2,500 cps.
4. Color: clear, amber

B. Properties of the mixed neat epoxy resin adhesive binder:

1. Compressive Properties (ASTM D-695) at 28 days
   a. Compressive Strength: 8,200 psi (56.5 MPa)
   b. Compressive Modulus: 166,000 psi (1,145 MPa)
2. Tensile Properties (ASTM D-638) at 14 days
   a. Tensile Strength: 5,900 psi (41MPa)
   b. Elongation at Break: 30.0 % min.
   c. Modulus of Elasticity: 190,000 psi (1,310 MPa)
3. Flexural Properties (ASTM D-790) at 14 days
   a. Flexural Strength (Modulus of Rupture): 6,800 psi (47 MPa)
   b. Tangent Modulus of Elasticity in Bending: 270,000 psi (1,910 MPa)
4. Shear Strength (ASTM D-732) at 14 days: 5,400 psi (37.2 MPa)
5. Total Water Absorption (ASTM D-570) at 7 days: 0.23%. (2 hour boil)

6. Bond Strength (ASTM C-882) Hardened Concrete to Hardened Concrete

    a. 2 day (dry cure): 1,100 psi (7.5 MPa)
    b. 14 day (moist cure): 1,600 psi (11.0 MPa)

7. Deflection Temperature (ASTM D-648) at 14 days: 111F (fiber stress loading = 66 psi)
8. The epoxy resin adhesive binder shall conform to ASTM C-881 and AASHTO M235-90.
9. The epoxy resin adhesive binder shall be approved by the United States Department of Agriculture.

C. Properties of the epoxy resin broadcast (epoxy resin/aggregate* = 1/2.25 by volume):

1. Compressive Properties (ASTM D-695) at 28 days

    a. Compressive Strength: 7,850 psi (54.1 MPa)
    b. Compressive Modulus: 600,000 psi

2. Tensile Properties (ASTM D-638) at 14 days

    a. Tensile Strength: 2,200 psi (15.2 MPa)
    b. Elongation at Break: 1.1%
    c. Modulus of Elasticity: 478,000 psi (3,240 MPa)

3. Flexural Properties (ASTM D-790) at 14 days

    a. Flexural Strength (Modulus of Rupture): 4,300 psi (29.7 MPa)
    b. Tangent Modulus of Elasticity in Bending: 900,000 psi (6,205 MPa)

4. Shear Strength (ASTM D-732) at 14 days: 3,300 psi (22.7 MPa)
5. Deflection Temperature (ASTM D-648) at 14 days: 111F min. (fiber stress loading = 66 psi)
6. Abrasion (Taber Abrader) at 14 days:

    a. Weight Loss: 1.85 gm max. (H-22 wheel; 1000 gm weight; 1000 cycles)

* Aggregate used shall conform to ASTM C-190.

Note: Tests were performed with material and curing conditions at 71- 75F & 45-55% relative humidity.

Part 3 – Execution

3.01 Surface Preparation

A. The substrate must be clean, dry, sound and free of surface contaminants. Remove all traces of dust, laitance, grease, oils, curing compounds, form release agents and foreign particles by mechanical means, i.e. – milling, scarifying, shotblasting, etc., as approved by the engineer. Blow surface free of dust using compressed air line equipped with an oil trap.

3.02 Mixing & Application

A. Mixing the epoxy resin adhesive binder: Proportion equal parts by volume of Component "A" and Component "B" into a clean, dry mixing pail. Mix thoroughly for 3 minutes min. with a jiffy paddle on a low-speed (400-600 rpm) drill. Mix only that quantity of material that can be used within its pot life (25-35 minutes at 73 F).

B. Priming of the substrate is optional but highly recommended. Primer should be used where sealing of non-moving existing cracks is desired. Prime the prepared substrate with the mixed epoxy resin adhesive binder using a roller or flat squeegee. Do not over prime or puddle. Coverage should be approximately 200-250 sq ft/gal min.

C. Non-moving cracks>1/8" shall be treated by the gravity feed method using the appropriate sealer/healer material. All dynamic cracks >1/8" should be treated as joints and sealed with the appropriate joint sealer.

D. While the primer is still tacky, apply the epoxy resin adhesive with a $^{3}/_{16}$ in. x $^{3}/_{16}$ in. (4mm x 4mm) notched squeegee. Allow the binder to self-level, and then slowly broadcast an oven-dried sand in such a manner that the sand drops vertically into the binder. Broadcast lightly making several passes, allowing the binder to bleed through the sand before the next pass. Cover completely with sand before the binder becomes tack-free. Estimate oven-dried sand quantity required to broadcast to excess at 2 lbs./sq. ft. Remove excess aggregate when the broadcast overlay has reached sufficient cure as to not be damaged.

E. Seal Coat is optional but suggested. Seal coat the surface with neat Sikadur 22 Lo Mod or Sikafloor 90P using a roller or flat rubber squeegee. Do not apply the seal coat too heavy as to lose the slip resistant surface texture. Recommended application rate is about 150-200 sq.ft./gal. When applying the seal coat, never stop the application until the entire surface has been sealed, if possible. If impossible, always discontinue at an edge, corner, or joint. Never let a previously coated film dry, always top coat into a wet film. Always apply the seal coat at a 45° angle to an edge, corner, or joint.

F. Job site mock-up should always be completed to confirm acceptability of workmanship, material coverage rates and aesthetics.

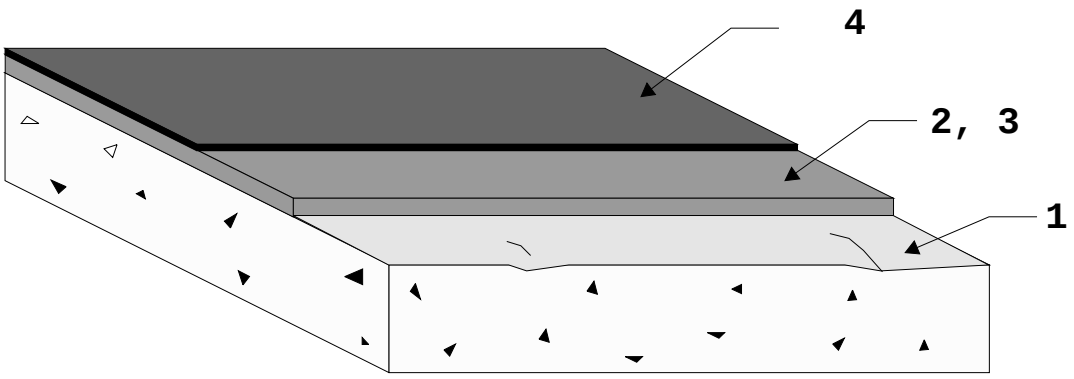
G. Adhere to all limitations and cautions for the epoxy resin adhesive binder in the manufacturers current printed literature.

3.05 Cleaning

A. The uncured epoxy resin adhesive can be cleaned from tools with an approved solvent. The cured epoxy resin adhesive can only be removed mechanically.

B. Leave finished work and work area in a neat, clean condition without evidence of spillovers onto adjacent areas.

SC-032 Sikadur® 22, Broadcast Overlay



1. Using a roller prime prepared substrate with neat Sikagard 22, Lo-Mod.

2. Apply binder coat (50 mils) with a $^{3}/_{16}$" x $^{3}/_{16}$" notched rubber squeegee while primer is still wet. Allow the binder to self-level.

3. Slowly broadcast an oven-dried sand into the binder, making several passes, allow the binder to bleed through the sand before making the next pass, cover completely.

4. After broadcast has reached sufficient cure, remove excess sand. Top coat with neat Sikagard 22, Lo-Mod or Sikafloor 90P using a roller or flat squeegee.

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